

## IN THE CLAIMS:

Please amend the claims to read as follows:

1. (Currently amended) A method of obtaining predictive information for inhomogeneous financial time series, comprising the steps of:
  - constructing an inhomogeneous time series  $z$  that represents received financial market transaction data;
  - constructing an exponential moving average operator  $EMA[\tau;z]$ ;
  - constructing an iterated exponential moving average operator based on said exponential moving average operator;
  - constructing a time-translation-invariant, causal operator  $\Omega[z]$  that is a convolution operator with kernel  $\omega$  and that is based on said iterated exponential moving average operator; and
  - electronically calculating in a computer values of one or more predictive factors relating to said time series  $z$ , wherein said one or more predictive factors are defined in terms of said operator  $\Omega[z]$ .

2. (Original) The method of claim 1, wherein said operator  $\Omega[z]$  has the form:

$$\begin{aligned}\Omega[z](t) &= \int_{-\infty}^t dt' \omega(t-t') z(t') \\ &= \int_0^{\infty} dt' \omega(t') z(t-t').\end{aligned}$$

3. (Previously presented) The method of claim 1, wherein said exponential moving average operator  $EMA[\tau;z]$  has the form:

$$EMA[\tau;z](t_n) = \mu EMA(\tau;z)(t_{n-1}) + (\nu - \mu) z_{n-1} + (1 - \nu) z_n, \text{ with}$$

$$\alpha = \frac{t_n - t_{n-1}}{\tau}$$

$$\mu = e^{-\alpha},$$

where  $\nu$  depends on a chosen interpolation scheme.

4. (Original) The method of claim 1, wherein said operator  $\Omega[z]$  is a differential operator  $\Delta[\tau]$  that has the form:

$$\Delta[\tau] = \gamma(EMA[\alpha\tau, 1] + EMA[\alpha\tau, 2] - 2EMA[\alpha\beta\tau, 4]),$$

where  $\gamma$  is fixed so that the integral of the kernel of the differential operator from the origin to the first zero is 1;  $\alpha$  is fixed by a normalization condition that requires  $\Delta[\tau; c]=0$  for a constant  $c$ ; and  $\beta$  is chosen in order to get a short tail for the kernel of the differential operator  $\Delta[\tau]$ .

5. (Original) The method of claim 4 wherein said one or more predictive factors comprises a return of the form  $r[\tau]=\Delta[\tau; x]$ , where  $x$  represents a logarithmic price.

6. (Original) The method of claim 1 wherein said one or more predictive factors comprises a momentum of the form  $x - EMA[\tau; x]$ , where  $x$  represents a logarithmic price.

7. (Original) The method of claim 1 wherein said one or more predictive factors comprises a volatility.

8. (Original) The method of claim 7 wherein said volatility is of the form:

$Volatility[\tau, \tau', p; z]=MNorm[\tau/2, p; \Delta[\tau'; z]]$ , where

$MNorm[\tau, p; z]=MA[\tau; |z|^p]^{1/p}$ , and

$$MA[\tau, n]=\frac{1}{n} \sum_{k=1}^n EMA[\tau', k], \text{ with } \tau'=\frac{2\tau}{n+1},$$

and where  $p$  satisfies  $0 < p \leq 2$ , and  $\tau'$  is a time horizon of a return  $r[\tau]=\Delta[\tau; x]$ , where  $x$  represents a logarithmic price.

9. (Currently amended) A method of obtaining predictive information for inhomogeneous financial time series, comprising the steps of:

constructing an inhomogeneous time series  $z$  that corresponds to received financial market transaction data;

constructing an exponential moving average operator;

constructing an iterated exponential moving average operator based on said exponential moving average operator;

constructing a time-translation-invariant, causal operator  $\Omega[z]$  that is a convolution operator with kernel  $\omega$  and that is based on said iterated exponential moving average operator;

constructing a standardized time series  $z$ ; and

electronically calculating in a computer values of one or more predictive factors relating to said time series  $z$ , wherein said one or more predictive factors are defined in terms of said standardized time series  $z$ .

10. (Original) The method of claim 9 wherein the standardized time series  $z$  is of the form:

$$\hat{z}[\tau] = \frac{z - MA[\tau; z]}{MSD[\tau; z]}$$

where

$$MA[\tau, n] = \frac{1}{n} \sum_{k=1}^n EMA[\tau', k], \text{ with } \tau' = \frac{2\tau}{n+1}, \text{ and}$$

$$\text{where } MSD[\tau, p; z] = MA[\tau; |z - MA[\tau; z]|^p]^{1/p}.$$

11. (Original) The method of claim 9 wherein said one or more predictive factors comprises a moving skewness.

12. (Previously presented) The method of claim 11 wherein said moving skewness is of the form:

$$MSkewness[\tau_1, \tau_2; z] = MA[\tau_1; \hat{z}[\tau_2]^3]$$

where  $\tau_1$  is the length of a time interval around time "now" and  $\tau_2$  is the length of a time interval around time "now- $\tau$ ".

13. (Original) The method of claim 12 wherein the standardized time series  $\hat{z}$  is of the form:

$$\hat{z}[\tau] = \frac{z - MA[\tau; z]}{MSD[\tau; z]}$$

where

$$MA[\tau, n] = \frac{1}{n} \sum_{k=1}^n EMA[\tau', k], \text{ with } \tau' = \frac{2\tau}{n+1}, \text{ and}$$

$$\text{where } MSD[\tau, p; z] = MA[\tau; |z - MA[\tau; z]|^p]^{1/p}.$$

14. (Original) The method of claim 9 wherein said one or more predictive factors comprises a moving kurtosis.

15. (Original) The method of claim 14 wherein said moving kurtosis is of the form

$$MKurtosis[\tau_1, \tau_2; z] = MA[\tau_1; \hat{z}[\tau_2]^4],$$

where  $\tau_1$  is the length of a time interval around time "now" and  $\tau_2$  is the length of a time interval around time "now- $\tau$ ."

16. (Original) The method of claim 15 wherein the standardized time series  $\hat{z}$  is of the form:

$$\hat{z}[\tau] = \frac{z - MA[\tau; z]}{MSD[\tau; z]}$$

where

$$MA[\tau, n] = \frac{1}{n} \sum_{k=1}^n EMA[\tau', k], \text{ with } \tau' = \frac{2\tau}{n+1}, \text{ and}$$

$$\text{where } MSD[\tau, p; z] = MA[\tau; |z - MA[\tau; z]|^p]^{1/p}.$$

17. (Currently amended) A method of obtaining predictive information for inhomogeneous financial time series, comprising the steps of:

constructing an inhomogeneous time series  $z$  that corresponds to received financial market transaction data;

constructing an exponential moving average operator  $EMA[\tau; z]$ ;

constructing an iterated exponential moving average operator based on said exponential moving average operator  $EMA[\tau; z]$ ;

constructing a time-translation-invariant, causal operator  $\Omega[z]$  that is a convolution operator with kernel  $\omega$  and time range  $\tau$ , and that is based on said iterated exponential moving average operator;

constructing a moving average operator  $MA$  that depends on said  $EMA$  operator;

constructing a moving standard deviation operator  $MSD$  that depends on said  $MA$  operator; and

electronically calculating in a computer values of one or more predictive factors relating to said time series  $z$ , wherein said one or more predictive factors depend on one or more of said operators  $EMA$ ,  $MA$ , and  $MSD$ .

18. (Original) The method of claim 17 wherein said one or more predictive factors comprises a moving correlation.

19. (Original) The method of claim 18 wherein said moving correlation is of the form:

$$MCorrelation[\hat{y}, \hat{z}](t) = \int_0^{\infty} \int_0^{\infty} dt' dt'' c(t', t'') \hat{y}(t - t') \hat{z}(t - t'').$$

20. (Currently amended) A method of obtaining predictive information for inhomogeneous financial time series, comprising the steps of:

constructing an inhomogeneous time series  $z$  that corresponds to received financial market transaction data;

constructing a complex iterated exponential moving average operator  $EMA[\tau; z]$ , with kernel  $ema$ ;

constructing a time-translation-invariant-, causal operator  $\Omega[z]$  that is a convolution operator with kernel  $\omega$  and time range  $\tau$ , and that is based on said complex iterated exponential moving average operator;

constructing a windowed Fourier transform  $WF$  that depends on said  $EMA$  operator; and

electronically calculating in a computer values of one or more predictive factors relating to said time series  $z$ , wherein said one or more predictive factors depend on said windowed Fourier transform.

21. (Previously presented) The method of claim 20 wherein said complex iterated exponential moving average operator  $EMA$  has a kernel  $ema$  of the form:

$$ema[\zeta, n](t) = \frac{1}{(n-1)!} \left( \frac{t}{\tau} \right)^{n-1} \frac{e^{-\zeta}}{\tau}$$

$$\text{where } \zeta \in C, \text{ with } \zeta = \frac{1}{\tau}(1+ik).$$

22. (Original) The method of claim 20 wherein  $EMA$  is computed using the iterative computational formula:

$$EMA[\zeta; z](t_n) = \mu EMA[\zeta; z](t_{n-1}) + z_{n-1} \frac{\nu - \mu}{1+ik} + z_n \frac{1 - \nu}{1+ik}, \text{ with}$$

$$\alpha = \zeta(t_n - t_{n-1})$$

$$\mu = e^{-\alpha}$$

where  $\nu$  depends on a chosen interpolation scheme.

23. (Original) The method of claim 20 wherein said windowed Fourier transform has a kernel  $wf$  of the form:

$$wf[\tau, k, n](t) = \frac{1}{n} \sum_{j=1}^n ema[\zeta, j](t).$$

24. (Previously presented) The method of claim 23 wherein said ema is of the form:

$$ema[\varsigma, n](t) = \frac{1}{(n-1)!} \left( \frac{t}{\tau} \right)^{n-1} \frac{e^{-\varsigma t}}{\tau}$$

where  $\varsigma \in C$  with  $\varsigma = \frac{1}{\tau}(1+ik)$ .

25. (Currently amended) A method of obtaining predictive information for inhomogeneous time series, comprising the steps of:

constructing an inhomogeneous time series  $z$  that represents time series data;

constructing an exponential moving average operator;

constructing an iterated exponential moving average operator based on said exponential moving average operator;

constructing a time-translation-invariant, causal operator  $\Omega[z]$  that is a convolution operator with kernel  $\omega$  and that is based on said iterated exponential moving average operator; and

electronically calculating in a computer values of one or more predictive factors relating to said time series  $z$ , wherein said one or more predictive factors are defined in terms of said operator  $\Omega[z]$ .